

REPORT OF THE SCIENTIFIC COMMITTEE FOR ANIMAL NUTRITION
ON THE USE OF FUMARIC AND MALIC ACIDS
IN FEEDINGSTUFFS

Opinion expressed 15 January 1980

TERMS OF REFERENCE (March 1979)

The Scientific Committee for Animal Nutrition is requested to give an opinion on the following questions :

1. Do fumaric and DL-malic acids added to feedingstuffs act as preservatives ?
2. Can they have harmful effects on the animal organism ?
3. Can they have adverse effects on the quality of animal products ?
4. Taking into account the answers to the abovementioned questions, should the use of these acids as preservatives in feedstuffs be continued and, if so, should the conditions of use be restricted ?

BACKGROUND

According to the provisions of Council Directive 70/524/EEC, of 23 November 1970, on additives in feedingstuffs (1), as last amended by the twenty-sixth Commission Directive of 18 December 1978 (2), Member States are authorized to make use, by way of derogation until 31 December 1979, of fumaric acid without specific conditions of use and malic acid for ensilaged feedingstuffs.

It is planned to authorize these products as preservatives in feedingstuffs throughout the Community.

(1) OJ No L 270, 14.12.1970, p. 1

(2) OJ No L 39, 14. 2.1979, p. 11

OPINION OF THE COMMITTEE

1. Fumaric and DL-malic acid are used as preservatives in certain feedingstuffs because of their antifungal and antibacterial properties. Their efficacy varies according to the conditions of use.
2. Fumaric and L-malic acid are natural components of plant and animal organisms which are consumed daily. They participate in many biochemical processes and are intermediate products of the Krebs cycle. D-malic acid and DL-malic acid (racemic mixture of the D- and L-isomers) do not occur naturally.

These acids have a very low acute chronic toxicity. Long-term oral administration of fumaric acid produced no ill effects in rats at a concentration of 1.2 % in the diet, in guinea pigs at 1.0 % and in dogs at 5.0 % (Landwirtschaftliche Schriftenreihe 1979). Long-term oral administration of DL-malic acid was without adverse effects in rats at concentrations of 0.05 % and 0.5 % in the diet. No adverse biological effects have been observed in dogs at a dietary concentration of 5 % (National Technical Information Service 1975).

The Joint FAO/WHO Expert Committee on Food Additives established an ADI of 6 mg/kg body weight for fumaric acid. The Codex Alimentarius Committee on Food Additives approved the use of this acid in jams and jellies, subject to a maximum level of 3 g/kg, and the use of DL-malic acid in certain fruit and vegetable preserves, jams, jellies and some fruit juices. The establishment of an ADI for DL-malic acid was not considered necessary (Joint FAO/WHO Food Standards Programme 1979).
3. Fumaric and DL-malic acid are normal intermediate metabolites in the animal organism and have no adverse effects on the quality of animal products.
4. In view of the above, the Committee is of the opinion that the use of fumaric and DL-malic acid as preservatives in feedingstuffs does not constitute any risk for animal or human health and does not have any unfavourable effects on the quality of animal products. It appears unnecessary to lay down any specific conditions for this particular use of the two acids.

NOTE

Although the opinion of the Committee has not been requested on this issue, its attention was drawn to the interest in these products as growth promoters. A symposium held at Gelsenkirchen in 1978 (Landwirtschaftliche Schriftenreihe 1979) concluded that the addition of certain concentrations of fumaric acid to the ration appreciably improves the growth rate of piglets after weaning, and of calves. It also improves the feed conversion rate of fattening pigs and broiler chicken. Scipioni et al. (1979) are of the opinion that fumaric and malic acid do not affect the growth of piglets up to the age of two months. However, appreciable weight gain manifests itself from the third month onwards. Other recent studies have demonstrated that the addition of fumaric acid to the feeding stuffs for beef cattle resulted in a 5 % improvement in growth.

REFERENCES

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